

SUPPLEMENT TO A "MONOGRAPH OF THE  
*TEMNOCEPHALEÆ*."\*

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(Plate xxii.)

The present communication consists (1) of descriptions of three additional species of *Temnocephala*, and (2) of some remarks on certain points in the structure of the members of the family, mainly suggested by a paper recently published by Monticelli.

*TEMNOCEPHALA TASMANICA*, n.sp.

(Plate xxii., figs. 1-2.)

This is a small species, never exceeding three or four millimetres in length. It resembles *T. quadricornis* in having four long and narrow tentacles (fig. 1) and a median dorso-ventrally compressed lobe in place of a fifth tentacle. The median lobe is supported on a stalk which is capable of being extended and contracted like the tentacles themselves.

The integument is devoid of pigment, and there are no eyes.

The intestine is devoid of the constrictions and septa that are regularly present in greater or smaller numbers in most of the other Australian species.

The posterior testes lie altogether behind the intestine, and partly behind the genital cloaca. They are of rounded shape with a process projecting inwards from which the vas deferens takes its origin. The anterior testes lie opposite the posterior

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\* Macleay Memorial Volume, pp. 93-152, pls. x.-xv. (1893).

part of the intestine : they are narrower than the posterior pair and are laterally compressed. The right and left vasa deferentia meet as usual in a pear-shaped vesicula seminalis connected with the bulb of the penis by a narrow ejaculatory duct.

The penis (fig. 2) is of a simple character. The tubular part is only slightly curved. The introvert is not very sharply marked off from the penis itself : in its interior are a number of long fine spines with a number of shorter spines round the margin.

This species was found in the branchial cavities of *Astacopsis tasmanicus* in small streams near Hobart, Tasmania, sometimes coming out on the outer surface of the Crayfish. Its eggs are attached to the bases of the gills.

In many respects this species resembles its much larger congener, *T. quadricornis*, which is also an inhabitant of Tasmania (living on the surface of the large Crayfish, *Astacopsis Franklinii*, that inhabits the northern rivers of that colony). In addition to the absence of pigment and of eyes in *T. tasmanica*, it differs from *T. quadricornis* in the structure of the penis, the spines of which are much less numerous, and less elaborately arranged in the former than in the latter.

#### TEMNOCEPHALA AURANTIACA, n.sp.

(Plate xxii., fig. 3.)

This species is of about the same size as *T. tasmanica*, and resembles it in all its external features, except that the integument contains an orange-coloured pigment and there is a pair of eyes. The tentacles are of essentially the same form. The penis, (fig. 3), however, is entirely different. The tubular portion is more strongly curved and the introvert more sharply marked off. The introvert is armed with numerous extremely fine spines.

This species was found on the lower surface of the abdomen of a species of *Astacopsis*, at present undetermined, that is found in burrows in damp ground in the neighbourhood of the Dee River towards the centre of Tasmania. The eggs were fixed on the inner surface of the branchiostegite.

*TEMNOCEPHALA CÆCA*, n.sp.

(Plate xxii., fig. 4.)

This species resembles the great majority of the members of the genus in the possession of five tentacles of equal, or nearly equal, length. It is quite white, and has no trace of eyes. The intestine is devoid of constrictions or septa. The posterior testes are situated altogether behind the intestine: they are of irregular rounded shape with a short inwardly projecting process from which the vas deferens is given off. The anterior testes, which lie at the sides of the intestine, are smaller than the posterior and are somewhat compressed laterally.

The penis is remarkable for the strong backward curvature of its tubular portion, a feature in which it differs from that of all the other known species. The introvert is not very distinctly separated off: it is beset with a number of very fine spines.

I am indebted to Prof. W. Baldwin Spencer for sending me living specimens of this species, which he had noticed on the surface of the remarkable burrowing Isopod described by him and Mr. T. S. Hall under the name of *Phreatoicopsis*.\* They were found about twenty miles south of Colac in Victoria.

**The Temnocephalæ in general.**

In an important paper† recently published by Monticelli entitled "Sulla Temnocephala brevicornis, Mont. (1889) e sulle Temnocefale in generale," there are one or two misconceptions of importance which I take this opportunity of correcting. One of these relates to the position of the penis. Monticelli has fallen into a curious error with regard to this point. He seems, on the strength of his interpretation‡ of two figures in my first paper

\* Proc. Roy. Soc. Viet. 1896, p. 12.

† "Bolletino della Società di Naturalisti in Napoli." Anno xii. Vol. xii. (1898). For a separate copy of the paper I am indebted to the author.

‡ The interpretation was incorrect. One of the figures in question is a diagram of the general organisation of *Temnocephala*, the animal being looked at from the ventral side. The other is a transverse section *with its posterior surface upwards*, it being one of a series cut from behind forwards.

on *Temnocephala* (Q.J. Micro. Sci. (2) Vol. 28) to have come to the rather odd conclusion that I had mistaken right for left throughout, and that when I stated that the penis of the Australian species is in all cases on the left, I meant on *my* left and on the right of the animal! Accordingly in the synoptical table of the species which he gives at the end of his paper he divides the species of *Temnocephala* into two groups—the group of American species with the penis on the left, and that of “Oceanic” species with the penis on the right.

In his account of the male reproductive apparatus in *T. brevicornis*, Monticelli (*l.c.* p. 81) states that on each side there are two ducts, one from the anterior testis and one from the posterior, and that these unite to form a main duct, right or left as the case may be—the arrangement being similar to what I have described as existing in *Actinodactylella*. He conjectures that this may be universal in *Temnocephala*. But, as stated and clearly figured by Weber in the case of *T. Semperi*, and by me in the case of the Australian and New Zealand species, the usual condition is quite different from this. In all these species the anterior testis is joined directly to the posterior by a short duct, and a single vas deferens is present on each side, coming off from the posterior testis, but really acting as the efferent duct of both. This is rendered clear enough by figures already published, but the portion of a horizontal section of *T. fasciata* represented in fig. 5 will still further illustrate the arrangement. The same holds good of *T. minor*, *T. Dendyi*, *T. comes*, *T. quadricornis*, *T. Novæ-Zelandiæ*, *T. aurantiaca*, *T. Tasmanica*, *T. cæca* and *Craspedella Spenceri*.

It would thus appear as if we must admit the existence of an important difference in structure between *T. brevicornis* and the Australasian species. But I think that Monticelli's statement and figure may be interpreted in another way. I think that what he looks upon as the duct of the anterior testis may be in reality the strand of ducts of the granule glands, which he says he was unable to find. The glands in question are mainly situated

about the region between the anterior and posterior testes, and their ducts form a strand running exactly in the position which in his fig. 18 Monticelli assigns to the posterior vas deferens.\* The appearance which he figures is, in fact, presented by several of my preparations of entire specimens of Australian species; and it is only with difficulty that it can be clearly demonstrated in these that the true interpretation is as I have stated.

Monticelli† states (*l.c.* p. 87) that the sac which is by Weber and other authors termed receptaculum seminis and which I have called receptaculum vitelli, is in *T. brevicornis* always filled not with yolk but with spermatozoa. In the Australian and New Zealand species, on the other hand, when any sperms at all are to be detected in the interior of the receptacle, they are always present only in small number, the bulk of the contents or, more usually, the entire contents, consisting of the finely granular vitelline matter. This sac, in fact, acts as the receptacle in which the vitelline matter collects in anticipation of the discharge of a mature ovum from the ovary; when this discharge takes place the vitelline matter is found to have become transferred to the uterus in which the completed egg becomes formed—the receptaculum being now empty or nearly so. It is the anterior part of the oviduct that performs the function of retaining the sperms. The proper designation of the receptacle is thus, in the Australasian species at least, not receptaculum seminis, but receptaculum vitelli. ‡

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\* Compare this with fig. 1 of Plate xv. in my "Monograph."

† Monticelli has misunderstood my statement with regard to the termination of these ducts. He says, "L'Haswell (3, p. 13) non ha potuto seguire l'ultimo decorso dei vitellodotte, nè accettarsi del punto di sbocco del condotto vitellino." In the passage to which he refers I state distinctly that that they open into the oviduct close to the ovary and receptaculum vitelli.

‡ A precisely similar vitelline receptacle with similar relations occurs in some Rhabdocoeles.

## EXPLANATION OF PLATE XXII.

*e.s.*, ejaculatory sac. *l.v.d.*, left vas deferens. *r.v.d.*, right vas deferens.  
*ves.*, vesicula seminalis.

Fig. 1.—*Temnocephala tasmanica*: outline of tentacles; from a living specimen.

Fig. 2.—*T. tasmanica*: penis and neighbouring parts; from dorsal side.

Fig. 3.—*T. aurantiaca*; penis and neighbouring parts; ventral aspect.

Fig. 4.—*T. cæca*: penis and neighbouring parts; from the dorsal side.

Fig. 5.—*T. fasciata*: portion of a horizontal section in the plane of the duct (*dt.*) connecting the anterior (*a.t.*) with the posterior testis (*p.t.*).